PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
181		
International application No.	International filing date (*day/month/year*)	Priority Date (*day/month/year*)
PCT/KR 2003/000721	10 April 2003 (10.04.2003)	11 April 2002 (11.04.2002)
International Patent Classification (IPC) or national classification and IPC		
IPC[7]: C07D 241/04, C07C 259/06		
Applicant		
SK CHEMICALS, CO., LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I. ☒ Basis of the opinion
   - II. ☐ Priority
   - III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV. ☐ Lack of unity of invention
   - V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI. ☐ Certain documents cited
   - VII. ☐ Certain defects in the international application
   - VIII. ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
07.11.2003	16 July 2004 (16.07.2004)
Name and mailing address of the IPEA/AT Austrian Patent Office Dresdner Straße 87 A-1200 Vienna Facsimile No. 1/53424/200	Authorized officer SLABY S. Telephone No. 1/53424/348

Form PCT/IPEA/409 (cover sheet) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 2003/000721

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:
pages 1-30, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☒ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages 31,32, filed with the letter of 25 November 2003 (25.11.2003).

☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____.

☐ the claims, Nos. _____.

☐ the drawings, sheets/fig _____.

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 2003/000721

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-3	YES
	Claims	---	NO
Inventive step (IS)	Claims	1-3	YES
	Claims	---	NO
Industrial applicability (IA)	Claims	1-3	YES
	Claims	---	NO

Citations and explanations (Rule 70.7)

The following documents have been cited in the Search Report:

D1: WO 02/22577 A2
D2: WO 01/38322 A1

The present application relates to α,β-unsaturated hydroxamic acid derivatives and their use as histoine deacetylase inhibitors.

The documents cited in the search report describe compounds similar to those claimed in the application, but in none of these documents the subject matter of the application is described. Claims 1-3 are therefore novel re D1 and D2 (Article 33 (2) PCT).
The subject matter of the present application cannot be regarded as obvious, inventive step is acknowledged (Article 33 (3) PCT).

Industrial applicability is given.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: I 5.

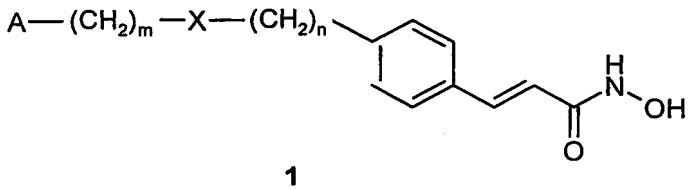
The amendments filded with the letter of 25.11.2003 are considered to go beyond the disclosure as filed, because the application as originally filed does not mention pharmaceutically acceptable salts of the componds of the originally filed claim 2. The application as originally filed only mentions pharmaceutically acceptable salts of compounds of formula I. Since the compounds of the originally filed claim 2 are not within the scope of formula I there is no suggestion of pharmaceutically acceptable salts of the compounds of the originally filed claim 2.
Therefore, the examination report is established on basis of the amended claims filed with the demand.

Claims

What is claimed is:

~~1.A compound represented by formula (1):~~

—



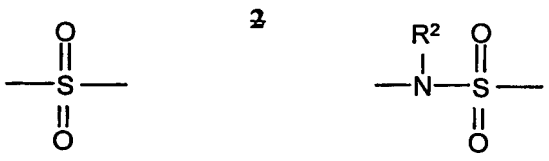
1

~~wherein A is an optionally substituted phenyl or aromatic heterocyclic group which has 1 to 4 substituents selected from the group consisiting of a halogen atom, a hydroxyl group, an amino group, a nitro group, a cyano group, an alkyl group having 1 to 4 carbons, an alkoxy group having 1 to 4 carbons, an aminoalkyl group having 1 to 4 carbons, an alkylamino group having 1 to 4 carbons, an acyl group having 1 to 4 carbons, an acylamino group having 1 to 4 carbons, an alkylthio group having 1 to 4 carbons, a perfluoroalkyl group having 1 to 4 carbons, a perfluoroalkoxy group having 1 to 4 carbons, a carboxyl group, an alkoxycarbonyl group having 1 to 4 carbons, a phenyl group, an aromatic heterocyclic group and a heterocyclic group, said heterocyclic group being optionally substituted with an alkyl group having 1 to 4 carbons, a benzyl group, or a pyridylmethyl group;~~

~~m is an integer of 0 to 4;~~

~~n is an integer of 1 to 4;~~

~~X is a moiety having a structure selected from those illustrated in formula (2)~~



~~2~~

~~R^1 and R^3 are independently H or an optionally substituted alkyl group having 1 to 4 carbons; or~~

~~a pharmaceutically acceptable salt thereof.~~

~~2.~~1. A compound ~~of formula (1) according to claim 1~~ selected from the group consisting of

N-[4-(2-Hydroxycarbamoylvinyl)benzyl]-4-pyrrolidin-1-ylbenzamide, and

4-Dimethylamino-*N*-[4-(2-hydroxycarbamoylvinyl)benzyl]benzamide; or

a pharmaceutically acceptable salt thereof.

~~3.~~ 2. A pharmaceutical composition comprising a compound ~~of formula (1)~~ according to claim 1 in combination with a pharmaceutically acceptable excipient or diluent.

~~4.~~ 3. Use of a compound according to claim 1 for the preparation of a medicament having histone deacetylase (HDAC) inhibitory activity.

~~5. Use of a compound according to claim 4 as an inhibitor of cell proliferation.~~

~~6. Use of a compound according to claim 4 as an antitumor agent.~~